Optimization of freeze drying conditions for purified serine protease from mango (Mangifera indica Cv. Chokanan) peel.

ABSTRACT

This study investigated the possible relationship between the encapsulation variables, namely serine protease content (9–50 mg/ml, X1), Arabic gum (0.2–10% (w/w), X2), maltodextrin (2–5% (w/w), X3) and calcium chloride (1.3–5.5% (w/w), X4) on the enzymatic properties of encapsulated serine protease. The study demonstrated that Arabic gum, maltodextrin and calcium chloride, as coating agents, protected serine protease from activity loss during freeze-drying. The overall optimum region resulted in a suitable freeze drying condition with a yield of 92% for the encapsulated serine protease, were obtained using 29.5 mg/ml serine protease content, 5.1% (w/w) Arabic gum, 3.5% (w/w) maltodextrin and 3.4% (w/w) calcium chloride. It was found that the interaction effect of Arabic gum and calcium chloride improved the serine protease activity, and Arabic gum was the most effective amongst the examined coating agents. Thus, Arabic gum should be considered as potential protection in freeze drying of serine protease.

Keyword: Optimization; Encapsulation; Serine protease; Freeze drying; Mango peel.